

**Disclaimer:**

This English translation is produced by machine translation and may contain errors. The JPO, the INPI, and those who drafted this document in the original language are not responsible for the result of the translation.

**Notes:**

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

Translated: 08:27:28 JST 04/12/2010

Dictionary: Last updated 03/12/2010 / Priority:

---

## FULL CONTENTS

---

**[Claim(s)]**

[Claim 1]While having the axis of rotation on one side of a pedestal, establishing two or more fluid passages independent inside a pedestal in an opposite side along a field in a polish tool which has arranged a whetstone pellet and providing a receipts-and-payments passage of each of this fluid passage in the axis of rotation, A polish tool holding a whetstone pellet which makes said each fluid passage and a cylinder hole open for free passage in an opposite side of a pedestal, and from which a particle size differs for every fluid passage in this cylinder hole by a piston mechanism.

[Claim 2]The polish tool according to claim 1 which adheres a larger stopper than a cylinder hole to a fluid aisle side of a piston in a piston mechanism, and is characterized by making a whetstone pellet into structure which adhered at the opposite side side of a pedestal.

---

**[Detailed Description of the Invention]****[0001]**

[Industrial Application]This invention relates to improvement of a polish tool feasible from rough polish to final polishing by a single tool.

**[0002]**

[Description of the Prior Art]Although usually gradually ground from rough polish to final polishing in polish processing, changing a polish tool, Since a polish tool must be renewed with a help when the grinder which can equip only with one polish tool performs this polish processing, tool exchange takes most time and polish efficiency is low.

[0003]Then, the holder for polish tool attachment is arranged in the shape of a tandem to one set of a grinder, each holder is equipped with the polish tool of a particle size to the small large particle size of \*\*\*\* one by one toward the appearance side from the ON side, and the grinder

which was made to perform from rough polish to final polishing continuously is also developed. However, since such a grinder becomes large-sized and a price needs a large area also for installation highly, polish cost goes up.

[0004]From such a background, the cylindrical abrasive soap in which particle sizes differ is adhered to one side of one polish tool, and the polish tool it enabled it to perform continuously is developed and marketed from rough polish to final polishing also with the grinder with which only one piece can equip with a polish tool. The polish tool shown in drawing 3 is this one example, the axis of rotation 2 is perpendicularly adhered to one side of the desk-like pedestal 1, and it arranges and adheres to the opposite side of the pedestal 1 so that the thing of each particle size may become concentric circular about the whetstone pellets 3, 3a, and 3b from which the particle size which the same height fabricated cylindrical differs.

[0005]Since the whetstone pellets 3, 3a, and 3b have a wear speed as quick as what has a coarse particle size when this polish tool fixes the axis of rotation 2 in the fixed direction and the pedestal 1 is rotated, rough polish is performed first automatically and, finally final polishing is performed. Since only the thing of the specific particle size of the whetstone pellets 3, 3a, and 3b can be contacted to an abradant with the angle of gradient theta if the direction of the axis of rotation 2 is changed when rotating the pedestal 1, it can carry out continuously from rough polish to final polishing.

[0006]However, since this polish tool has made the same height the whetstone pellets 3, 3a, and 3b, Even if polish does not advance and advances if it does not wait for wear of what has a coarse particle size when rotating a pedestal, where the axis of rotation 2 is fixed in the fixed direction, polish by what has a coarse particle size will be intermingled, and a polish crack will occur. If it differed even when the angles of gradient theta are few even if it adopts the method of changing the angle of gradient theta of the axis of rotation 2 to an abradant, in order that the whetstone pellet 3, 3a, or 3b of a different particle size might participate in polish, there was a fault that a setup of polish conditions was difficult.

[0007]

[Problem to be solved by the invention]This invention provides what does not have the above faults in one side in the polish tool which has arranged the whetstone pellet from which a particle size differs.

[0008]

[Means for solving problem]While this invention has the axis of rotation on one side of a pedestal, establishes two or more fluid passages independent inside the pedestal in an opposite side along a field in the polish tool which has arranged the whetstone pellet and provides the receipts-and-payments passage of each of this fluid passage in the axis of rotation, [ this invention ] Said each fluid passage and a cylinder hole open for free passage were made in the opposite side of a pedestal, and the whetstone pellet from which a particle

size differs for every fluid passage in this cylinder hole was held by the piston mechanism.

[0009]

[Function]The polish tool of this invention connects the distribution tube from a hydraulic system to each receipts-and-payments passage provided in the axis of rotation, and if it enables it to adjust the oil pressure of each distribution tube by inserting a regulating valve like an electromagnetic valve in each distribution tube, the oil pressure of each fluid passage inside a pedestal can be adjusted individually. Since the cylinder hole made in the opposite side of a pedestal is open for free passage with the fluid passage inside a pedestal, if the oil pressure of each fluid passage is adjusted, the projection height at the tip of a whetstone pellet in a cylinder hole can be adjusted for every fluid passage. Other fluid supply units, for example, a hydraulic gear, a compressed air device, etc. may be sufficient as a hydraulic system.

[0010]Since the whetstone pellet of a particle size which is different in each fluid passage is inserted in the cylinder hole here, Oil pressure of a fluid passage which acts on the whetstone pellet of a certain particle size is made high, and oil pressure of the remaining fluid passages is made low (for example, zero), and if it is made for the whetstone pellet tip of the fluid passage which made oil pressure high to project most highly, it can grind alternatively only with the whetstone pellet of a specific particle size. Therefore, the oil pressure of each fluid passage is adjusted, and if it is made for a fine whetstone pellet to project one by one most highly from a whetstone pellet with a coarse particle size, it can grind gradually from rough polish to final polishing. What is necessary is just to make low oil pressure added to the whetstone pellet, in order to retreat the projected whetstone pellet. Since polish makes only a whetstone pellet to use project most highly and performs it, even if it holds the axis of rotation in the fixed direction, a whetstone pellet not to use does not grind.

[0011]Although the tip of a thing to use projects a whetstone pellet most highly and its tip of other things should be just lower than it, it is difficult for it to adjust to arbitrary height by oil pressure. Then, it is preferred to form a stopper in a base so that the maximum projection height may become fixed at a whetstone pellet, to make a whetstone pellet project until a stopper acts by making oil pressure of only a specific fluid passage high, and to make it not apply oil pressure to other fluid passages.

[0012]

[Working example]Drawing 1 and drawing 2 show the polish tool of this invention, the pedestal 1 is carrying out desk-like shape like before, and the axis of rotation 2 adheres to the one side perpendicularly. The three fluid passages 4, 4a, and 4b independent inside the pedestal 1 are established in the position of the same depth along a desk side concentric circular, and each receipts-and-payments passage of the fluid passages 4, 4a, and 4b passes along the inside of the axis of rotation 2.

[0013]As shown in drawing 2, the ring shape cylinder holes 5, 5a, and 5b are made in the

portion in which said each fluid passages 4, 4a, and 4b of the opposite side of the pedestal 1 are established, and the cylinder holes 5, 5a, and 5b are open for free passage with the fluid passages 4, 4a, and 4b, respectively. These cylinder holes 5, 5a, and 5b have width narrower than the fluid passages 4, 4a, and 4b, and the ring shape pistons 6, 6a, and 6b have fitted into the inside of the cylinder holes 5, 5a, and 5b, respectively.

[0014]The ring shape spacer 7 of the same height that each projected at right angles to the fluid passages 4 and 4a and 4b lateral projection adheres to the pistons 6, 6a, and 6b, It adheres at the tip so that the ring shape stopper 8 wider than the cylinder holes 5, 5a, and 5b may become parallel to the pistons 6, 6a, and 6b. On the other hand, the cylindrical whetstone pellets 3, 3a, and 3b adhere to the opposite side side of the pedestal 1 of the pistons 6, 6a, and 6b at the predetermined intervals, and the whetstone pellets 3, 3a, and 3b adhere to the pistons 6, 6a, and 6b, respectively. Although these whetstone pellets 3, 3a, and 3b are all the same sizes, particle sizes differ in [ which adhered / every piston 6 and 6a and 6b ], and, moreover, the thing of the same particle size adheres to the same piston.

[0015]in this polish tool -- the fluid passages 4, 4a, and 4b -- a hydraulic system -- it connecting with a fluid pressurizer [ like ] and, For example, since only the piston 6 which has fitted into the cylinder hole 5 of the fluid passage 4 where fluid pressure is high will project and other pistons 6a and 6b will not be projected if fluid pressure of the fluid passage 4 is made high and fluid pressure of the fluid passages 4a and 4b is made low, it can grind only with the whetstone pellet 3. If fluid pressure of the fluid passage 4 made high is made low and fluid pressure of the fluid passage 4a is made high, the whetstone pellet 3 will retreat and only the whetstone pellet 3a will project it.

[0016]The whetstone pellets 3, 3a, and 3b made to hold by this polish tool to the pedestal 1 (mm [ in diameter / 150 ] and 35 mm in thickness) are made into a thing 23 mm in diameter, A particle size the whetstone pellets 3, 3a, and 3b, respectively, [ #400, #800, and #1500 ] The number was made into 12 pieces, 16 pieces, and 20 pieces, respectively, and a surface coarseness Rmax[ about 3 micrometers ] stainless steel plate (SUS304, 1.5 mm in thickness, size of 100x100 mm) was ground from the bottom in this state. Polish makes only the whetstone pellet 3 project first, and it moved the stainless steel plate top at the rate of 1000 mm/min by the pressure of 20 micrometer/pass, rotating the pedestal 1 at 500 rpm. Next, made only the whetstone pellet 3a project, and carried out similarly, only the whetstone pellet 3b was made to project finally, and it carried out similarly. The case where the surface coarseness Rmax of the stainless steel plate after grinding to Table 1 is ground as for three stainless steel plates is shown. A conventional example is only what adhered the same whetstone pellets 3, 3a, and 3b as having used it for the polish tool of this embodiment to the pedestal 1 as shown in drawing 4, and the number of the whetstone pellets 3, 3a, and 3b and arrangement are also made the same as that of the polish tool of an embodiment.

[0017]

[Table 1]

単位 (μm)

ステンレス鋼板	1枚目	2枚目	3枚目	平均
実施例研磨工具	0.21	0.20	0.23	0.22
従来研磨工具	0.35	0.22	0.31	0.29

[0018]When the time taken to grind the surface coarseness Rmax even to about 0.2 micrometer by the polish tool exchanged for this polish tool at a given particle size was compared, although it was 20 minutes, in the case of the polish tool exchanged at a given particle size, it required for this polish tool for 45 minutes (exchange time 20 minutes). The former was 0.21 micrometer and the latter of the surface coarseness Rmax was 0.22 micrometer.

[0019]

[Effect of the Invention]As mentioned above, since the polish tool of this invention has the structure where only the whetstone pellet of the same particle size can be made to project alternatively among the whetstone pellets from which the particle size with which the pedestal was equipped differs, also where the axis of rotation 2 is fixed in the fixed direction, it does not participate in polish other than the whetstone pellet made to project. Since it is not necessary to make the axis of rotation incline in order to change the particle size of a whetstone pellet, a setup of polish conditions is easy.

[Brief Description of the Drawings]

[Drawing 1]It is an embodiment front view of the polish tool concerning \*\*\*\*\*.

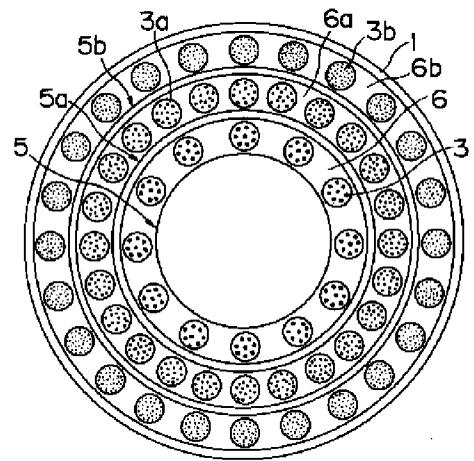
[Drawing 2]It is a main sectional view of \*\*\*\*\*1.

[Drawing 3]It is a sectional view of the polish tool of \*\*\*\*\*.

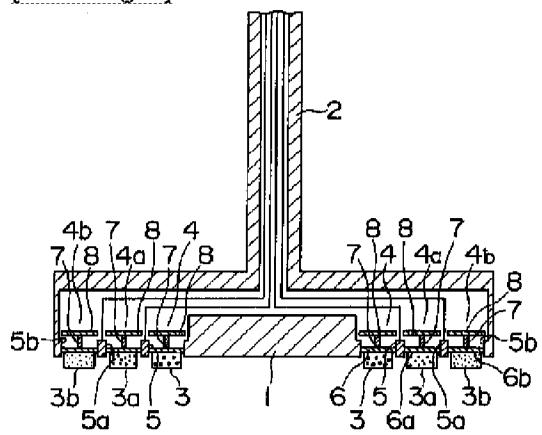
[Explanations of letters or numerals]

1 [ -- A fluid passage, 5, 5a, 5b / -- A cylinder hole, 6 6a 6b / -- A piston, 7 / -- A spacer, 8 / -- Stopper, ] -- A pedestal, 2 -- The axis of rotation, 3, 3a, 3b -- A whetstone pellet, 4, 4a, 4b

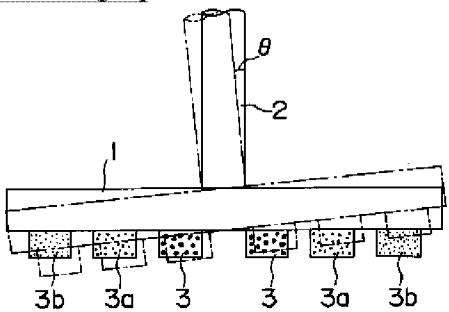
[Drawing 1]



[Drawing 2]



[Drawing 3]



---

---

[Translation done.]